POWER-DRIVEN ROTARY SELECTORS TOGETHER WITH ASSOCIATED BANKS PIECE-PART DATA AND REPLACEMENT PROCEDURES

1. GENERAL

1.01 This section covers the information necessary for ordering parts to be used in the maintenance of power driven rotary selectors (202, 203, 207, and 208 type selectors) together with associated banks.

1.02 This section is reissued to incorporate material from the addendum in its proper location. In this process marginal arrows have been omitted.

1.03 Part 2 of this section covers the piece part numbers and the corresponding names of the parts which it is practicable to replace in the field in the maintenance of power driven rotary selectors. No attempt should be made to replace parts not designated. Part 2 also contains explanatory figures showing the different parts. This information is called "Piece Part Data".

1.04 Part 3 of this section covers the approved procedures for the replacement of the parts covered under Part 2. This information is called "Replacement Procedures".

2. PIECE PART DATA

2.01 The figures included in this part show the various piece parts in their proper relation to other parts of the apparatus. The piece part numbers of the various parts are given together with the names of the parts as listed by the Western Electric Company Merchandise Department.

2.02 When ordering parts for replacement purposes give the piece part number as well as the name of the part. For example: "P-208449 Cover". Do not refer to the B.S.P. number or to any information as shown in parenthesis following the piece part number.

2.03 The following is a list of numbers and corresponding names of piece parts which are not common to all selectors.

Selector	Rotor Brush Assembly (Includes driven disc assembly)	Contact Spring Assembly
202C	P-172039	P-159070
202D	P-172040	P-159070
202E	P-172041	P-159070
203A	P-172876	P-159070
203B	P-172875	P-159070
203C	P-172876	P-169967
203D	P-172874	P-169967
203E	P-172876	P-208456
207A	P-172876	P-159070
207B	P-172875	P-159070
207C	P-172876	P-208456
208A	P-172876	P-169967
208B	P-172874	P-169967

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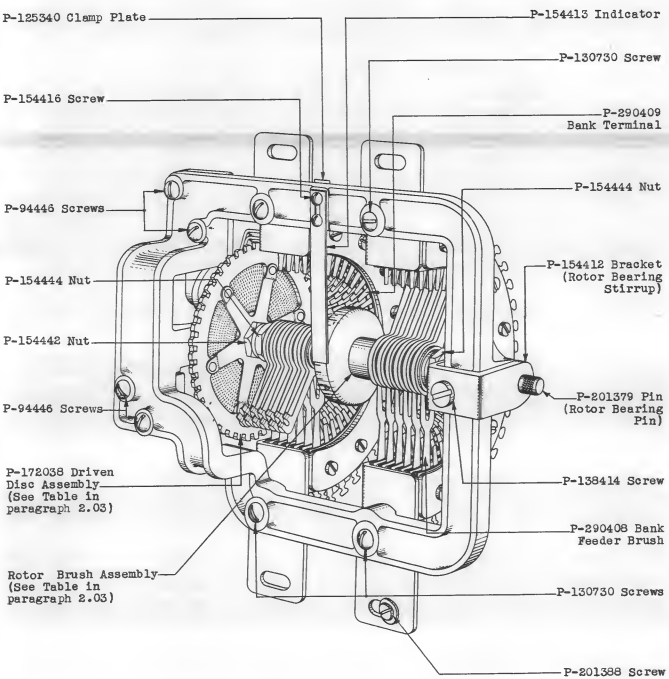

Fig. 1 - Front View Showing General Design of 202, 203, 207 and 208 Type Selectors Together with Associated Banks

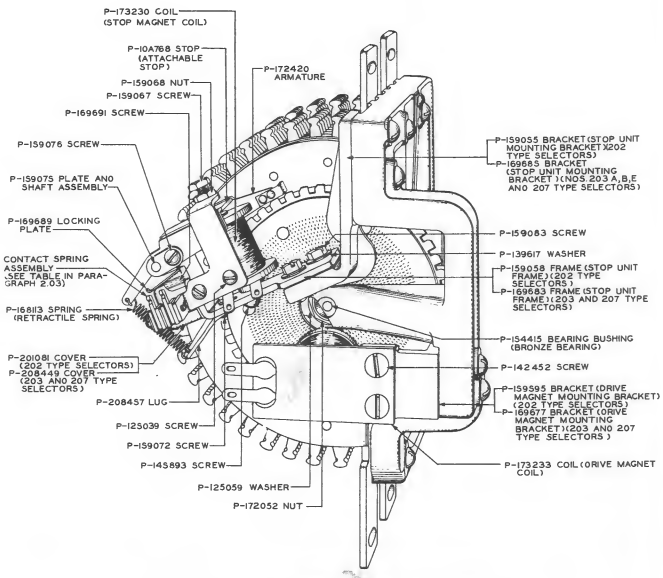
P-173230 COIL (STOP MAGNET COIL)
P-10A768 STOP (ATTACHABLE STOP)
P-159068 NUT
P-159067 SCREW
P-169691 SCREW
P-159076 SCREW
P-159075 PLATE AND SHAFT ASSEMBLY
P-169689 LOCKING PLATE
CONTACT SPRING ASSEMBLY (SEE TABLE IN PARAGRAPH 2.03)
P-168113 SPRING (RETRACTILE SPRING)
P-201081 COVER (202 TYPE SELECTORS)
P-208449 COVER (203 AND 207 TYPE SELECTORS)
P-208457 LUG
P-125039 SCREW
P-159072 SCREW
P-145893 SCREW
P-125059 WASHER
P-172052 NUT
P-172420 ARMATURE
P-159055 BRACKET (STOP UNIT MOUNTING BRACKET) (202 TYPE SELECTORS)
P-169685 BRACKET (STOP UNIT MOUNTING BRACKET) (NOS 203 A,B,E AND 207 TYPE SELECTORS)
P-159083 SCREW
P-139617 WASHER
P-159058 FRAME (STOP UNIT FRAME) (202 TYPE SELECTORS)
P-169683 FRAME (STOP UNIT FRAME) (203 AND 207 TYPE SELECTORS)
P-154415 BEARING BUSHING (BRONZE BEARING)
P-142452 SCREW
P-159595 BRACKET (DRIVE MAGNET MOUNTING BRACKET) (202 TYPE SELECTORS)
P-169677 BRACKET (DRIVE MAGNET MOUNTING BRACKET) (203 AND 207 TYPE SELECTORS)
P-173233 COIL (DRIVE MAGNET COIL)

Fig. 2 - Side View Showing General Design of 202 Type, Nos. 203A, B, E and 207 Type Selectors Together with Associated Banks

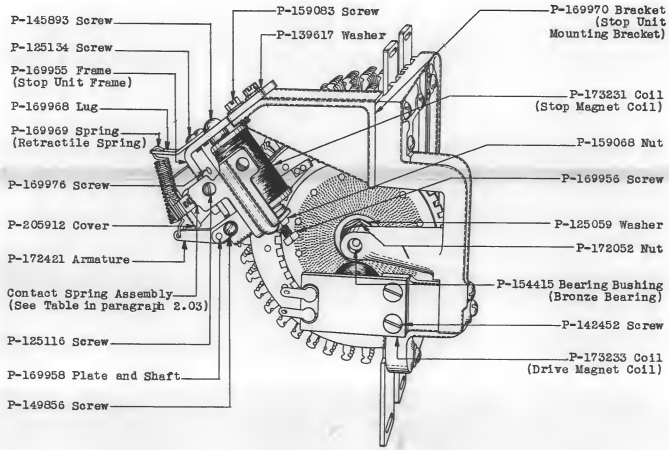

Fig. 3 - Side View Showing General Design of Nos. 2030, D and 203 Type Selectors Together with Associated Banks

3. REPLACEMENT PROCEDURES

3.01 List of Tools and Materials

Code or Spec.No.	Description
Tools	
236	9/16" Hex. Open Single End Offset Wrench
245	3/8" and 7/16" Hex. Open Double End Flat Wrench
310B (2 required)	9/32" Hex.Open Double End Offset Wrench
348	Bearing Remover
395A	Feeder Brush Spacer
563A	90° Offset Screwdriver
564A	45° Offset Screwdriver
575A	Feeder Brush Aligner
KS-8063	Electric Soldering Copper
-	6-1/2" P-Long Nose Pliers
-	3" Cabinet Screwdriver
-	4" Regular Screwdriver
KS-6320	Orange Stick
KS-7784	9/16" Hex. Socket Wrench
Materials	
KS-7860	Petroleum Spirits
-	6-32 Nut (See 3.29)

3.02 In general, before making replacements of any part of the apparatus covered herein make the associated circuit busy in the approved manner and block the necessary relays operated or non-operated to isolate the selector circuit.

3.03 Before replacing any part covered herein, check whether the replacing part is coated with a protective film of grease. If it is, remove the grease with the KS-7860 petroleum spirits and lubricate the part, if required, as outlined in Section 026-740-701.

3.04 After making any replacement of parts of the selectors covered herein, the part or parts replaced shall meet the readjust requirements involved as specified in Section 026-740-701. Other parts whose adjustments have been disturbed by the replacing operations shall be checked to the test requirements and an overall check shall be made of the apparatus before restoring the circuit to service.

3.05 No replacement procedures are specified for screws and other parts where the procedure consists of a single simple operation.

Rotor Bearing Pin, Stirrup Set Screw and Rotor Bearing Stirrup

3.06 Rotor Bearing Pin: Loosen the stirrup set screw with the 4" regular screwdriver. Support the rotor assembly with one hand and remove the bearing pin with the other hand. Insert a new bearing pin in the stirrup so as to hold the rotor assembly in place and securely tighten the stirrup set screw.

3.07 Stirrup Set Screw and Rotor Bearing Stirrup: To replace the stirrup set screw, hold the rotor assembly in one hand and remove the screw from the frame with the 4" regular screwdriver. To replace the stirrup, remove the stirrup set screw as outlined above and remove the bearing pin. Remove the stirrup and substitute the new part. Insert the bearing pin so as to hold the rotor assembly in place and insert and securely tighten the set screw.

Rotor Brush Assembly, Driven Disc Clamping Nut, Driven Disc Washer, Driven Disc Assembly, Driven Disc Lock Nut and Bronze Bearing

General

3.08 Scribe a line on both selector banks directly above the selector frame with a sharp pointed pencil. This will aid in relocating the selector frame. On the Nos. 203D and 208D selector, scribe the lines above the No. 64A apparatus blank instead of above the frame. Slightly loosen the stirrup set screw with a 4" regular screwdriver and the indicator mounting screws with the 3" cabinet screwdriver. Remove the lower indicator mounting screw, shift the indicator to a horizontal position and tighten the upper mounting screw. On the Nos. 203D and 208B selectors, the apparatus blank mounting screws should be loosened instead of the indicator mounting screws.

Rotor Brush Assembly

3.09 Rotate the brushes so that they are approximately horizontal and place a No. 395A feeder brush spacer over each set of feeder brushes in the position shown in Fig. 4. Remove the four selector frame mounting screws with the 4" regular screwdriver. Grasp the frame of the selector with the left hand near the driven disc and the right hand at the stirrup end. Pull the frame directly out until the feeder and rotor brushes are free. Using the left hand as a pivot, turn the frame of the selector away from the banks. After turning the rotor brush assembly so that it clears the bank shift the rotor bearing pin to the right sufficiently to release the end of the rotor shaft. With the right hand, remove the rotor brush assembly from the selector.

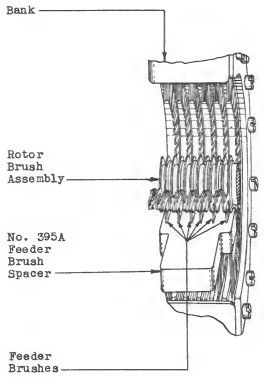

Fig. 4 - Method of Using No. 395A Feeder Brush Spacer

3.10 Substitute the new rotor brush assembly as follows (the rotor brush assembly includes the driven disc). Turn the rotor brush assembly so that the set of brushes nearer the driven disc is free from the associated bank. Then again, using the left hand as a pivot, turn the selector frame so that the set of rotor brushes nearer the stirrup end of the selector engages the associated bank. When these brushes have been placed in their proper positions on the bank, hold the selector frame with the left hand and with the right hand place the feeder brushes in their proper positions on the hub of the rotor brush assembly.

3.11 Then insert the selector frame mounting screws and remove the No. 395A feeder brush spacer. Before tightening the mounting screws, locate the selector frame so that it coincides with its former position on the banks as shown by the lines marked on the selector banks as covered in 3.08.

Driven Disc Assembly and Lock Nut

3.12 Remove the rotor brush assembly as outlined in 3.08 and 3.09. Mark on the outside edge of the notched rim at a point directly opposite the trailing edge of the hunting brush. Hold the driven disc clamping nut with one No. 236 wrench and remove the driven disc lock nut with the KS-7784 wrench.

3.13 If the washer is to be replaced, replace it at this time. Remove the driven disc. If the driven disc clamping nut is to be replaced, remove it and substitute a new one. Mark a new driven disc at a point corresponding to that on the one just removed, so as to maintain the proper relation between the notched rim and the hunting brush. Then replace the clamping nut. Mount this disc on the shaft and remount the washer and clamping nut. Before tightening the clamping nut, take care to place the point on the notched rim in approximately the same relative position to the hunting brush as previously noted on the notched rim of the disc that was replaced.

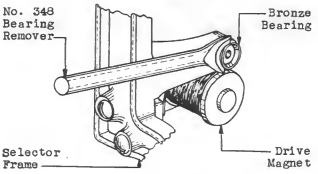

Fig. 5 - Method of Using
No. 348 Bearing Remover

Bronze Bearing

3.14 To replace the bronze bearing, remove the rotor brush assembly as outlined in 3.08 and 3.09. Remove the bearing with the No. 348 bearing remover applied in the manner shown in Fig. 5. Wedge the bearing remover between the bearing and the selector frame, forcing out the bearing. Press a new bearing into position and remount the rotor brush assembly as outlined in 3.10 and 3.11.

Drive Magnet Coil and Drive Magnet Mounting Bracket

3.15 To replace either of these parts, unsolder the wires from the magnet terminals. Remove the bracket clamping screws with the 4" regular screwdriver. Remove the drive magnet assembly from the rear of the switch. Remove the screws holding the magnet coil to the mounting bracket with the 4" regular screwdriver. Make the necessary replacement of parts and reassemble the parts on the selector frame. Resolder the wires to the magnet terminals.

Stop Unit Assembly and Associated Parts

3.16 General: When it is necessary to remove the stop unit to replace the magnet or any associated part, proceed as follows. Unsolder only those leads as required to replace the part. Remove the stop unit mounting screws with the 4-inch regular screwdriver and allow the unit to hang from the leads. After making the required replacement, securely remount the stop unit on the selector and resolder the disconnected leads.

3.17 Stop Magnet Coil: To replace the stop magnet coil unsolder the magnet leads. Remove the stop unit mounting screws with the 4-inch regular screwdriver and allow the stop unit to hang from its leads. Remove the coil mounting screw and remove the coil. If there is an attachable stop on the armature, remove and discard the stop. Mount the new coil in the stop unit so that the locating pin in the frame engages the slot in the end of the core of the coil. Tighten the mounting screw. Remount the stop unit on the selector and resolder the magnet leads.

3.18 Contact Spring Assembly: If a spring or mounting bracket requires replacement, replace the spring assembly as a unit. To do this, remove the mounting bracket mounting screws with the 3" cabinet screwdriver and remove the assembly. Substitute the new part and mount it securely in place.

3.19 Armature Backstop Screw and Lock Nut: To replace either of the parts, hold the screw with the No. 310B wrench and loosen the lock nut with another No. 310B wrench. Remove the screw. Make the necessary substitution of parts and mount the lock nut and screw in position.

3.20 Plate and Shaft Assembly: Disengage the retractile spring from the armature with the P-long nose pliers. Remove the plate clamping screw with the 3" cabinet screwdriver. Remove the plate and shaft assembly from the frame. Insert the new part and insert and securely tighten the mounting screw. Remount the retractile spring.

3.21 Armature Assembly: Remove the plate and shaft assembly as outlined in 3.20. Remove the armature assembly from the magnet frame. Substitute the new armature assembly in place and remount the plate and shaft assembly as outlined in 3.20.

3.22 Stop Unit Frame: Remove the parts mounted on the stop unit frame as outlined in 3.17 to 3.21, inclusive, and mount these parts on the new frame as outlined in these paragraphs.

3.23 Cover Clamping Plate: Remove the cover locating lugs with the 3" cabinet screwdriver and remove the clamping plate. Substitute the new part and mount it securely in place.

Retractile Spring and Retractile Spring Lug

3.24 Retractile Spring: Disengage the spring from the armature assembly and then disengage the other end from the adjusting lug. Substitute the new part and insert the end of the coil in the adjusting lug so that the end of the spring rests at the outside edge of the adjusting bracket. Attach the other end of the spring to the armature assembly.

3.25 Retractile Spring Lug: To replace this lug, remove the retractile spring as outlined in 3.24 and remove the lug clamping screws with the 3" cabinet screwdriver. Substitute the new part and mount it securely in position. Remount the retractile spring as outlined in 3.24.

Bank Feeder Brush Replacement

3.26 General: Where it is desired to replace worn bank feeder brushes with new feeder brushes instead of using the detachable feeder brush unit, proceed as outlined below.

Selector Not Equipped with Detachable Feeder Brushes

3.27 Remove the fuse which supplies current to the circuit associated with the drive and stop magnets. Cover the apparatus below the bank being worked upon to protect it against falling solder or screws.

3.28 Remove the selector from the bank as outlined in 3.08 and 3.09 except that the rotor assembly will not be removed from the selector frame and the indicator clamping screws will not be loosened. If necessary, tie the selector frame to the framework by means of a piece of cord taking care when doing this that the selector frame or any part does not come into contact with the vertical drive shaft and that the wiring is not damaged. Remove the feeder brush spacer mentioned in 3.09.

3.29 Remove the bank mounting screws of one selector bank with the 4" regular screwdriver and draw the bank to the front or rear of the framework depending upon which is more convenient taking care not to damage the bank wiring.

3.30 With the 4" regular screwdriver or the No. 563A or No. 564A offset screwdriver loosen the bank clamping screws sufficiently to remove the bank frame to make the bank feeder brushes accessible. The topmost bank clamping screw and a 6-32 nut may be used to keep the remainder of the bank assembly together. If necessary, remove the other bank clamping screws. Exercise care that the bank frame is not bent or damaged.

3.31 Starting with a feeder brush to be replaced or if all brushes are to be replaced starting with the No. 1 feeder brush, loosen the adhesive by which the feeder brush is held in position by means of the heat from a soldering copper held against the soldering terminal of the feeder brush. Take care not to touch the adjacent bank terminals with the soldering copper. While applying the soldering copper gently push the feeder brush toward the front of the bank by applying pressure with the KS-5320 orange stick near the prongs of the feeder brush. When the feeder brush is loose and while still hot, grasp the feeder brush near its base at the bank insulator with the long nose pliers and gently pull forward and out toward the front of the frame. Make sure that the brush is loose before pulling to avoid damaging the varnished muslin insulating material between which the feeder brush is set. If any metallic particles have accumulated near the base of the bank terminal adjacent to the bank feeder brush remove them to avoid a possible short circuit between the terminal and the feeder brush. Then unsolder the wires connected to the feeder brush and tag the wires for identification if necessary.

3.32 Where the bank is equipped with earlier type two piece feeder brushes or single piece unidirectional type feeder brushes, it will be necessary to remove all the other feeder brushes on the bank as outlined in 3.31 as only single piece feeder brushes of the balanced type are furnished as replacement parts.

3.33 Insert the soldering terminal end of the new feeder brush into the bank from the inside (terminal side) in the space between the varnished muslin left vacant by the removed feeder brush. Take care that the semi-circular notch in the edge of each new feeder brush is toward the bank terminals and that the brush is being inserted

between the varnished muslin. Press the brush through the bank until the soldering terminal protrudes slightly and at the same time press the brush outward so that it will readily slide between the varnished muslin without damaging it.

3.34 Reassemble the bank. Before tightening the clamping screws, press the prong ends of the brushes outward (towards the front) without forcing. With all brushes moved upward as far as the tinned part of the soldering terminal, place the No. 575A feeder brush aligner on the bank so that the wedge shaped block of the tool enters between the prongs on the feeder brushes. Move the tool toward the bank taking care that the frame of the bank goes between the lugs on the side of the tool. Force the tool down slowly until the locating pin on the bank enters the slot in the frame of the tool. Press the tool flat against the bank. With a bank mounting screw securely fasten the No. 575A tool to the bank frame using the upper clearance hole in the tool as illustrated in Fig. 6.

3.35 Make sure that each individual feeder brush bears tightly against the wedge shaped block of the tool and rests against the round block of the tool. These conditions will generally be met automatically, though in some cases it may be necessary to shift individual brushes slightly by pushing them up from underneath the bank.

3.36 When the feeder brushes are properly positioned and with the feeder brush aligner still held on the bank frame, start all the bank clamping screws a few turns into their respective tapped holes. Then securely tighten them starting at the bottom. Make sure that each feeder brush remains in position as outlined in 3.35. Remove the No. 575A tool and note that the feeder brushes are properly aligned and have not shifted during the tightening of the bank clamping screws. If not properly aligned loosen the bank clamping screws and reposition the bank feeder brushes to meet the conditions outlined in 3.35.

3.37 When properly aligned, solder the wires to the soldering terminals. Remount the banks on the framework and reassemble the selector frame on the banks. Then make sure that the selector meets the requirements specified in Section 026-740-701.

Selector Equipped with Detachable Feeder Brushes

3.38 Proceed as in 3.26 above. Then remove the detachable feeder brushes as covered in 3.39 and 3.40 before removing the selector frame from the bank.

3.39 Remove the detachable feeder brush mounting nut with the No. 245 wrench and remove the detachable feeder brushes. Remove the spacing washers and unscrew the stud on which the detachable feeder brushes were mounted.

3.40 Open the local cable form of the detachable feeder brush unit. Separate and tag the wires for identification if necessary. Cut the cable skinners so that the leads to the bank feeder brushes will be of sufficient length. Discard the detachable feeder brushes and associated parts.

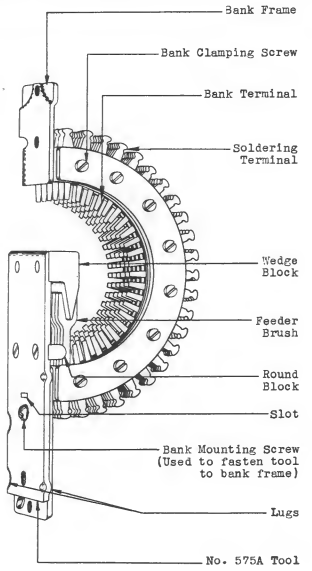

Fig. 6 - Feeder Brushes Aligned with No. 575A Tool

3.41 Proceed as in 3.28 to 3.37, inclusive. In case the brush has been cut short it may be necessary to grasp the brush at the soldering terminal instead of near the base as outlined in 3.31. In reassembling the selector on the bank a top selector mounting screw must be provided since the detachable feeder brush mounting stud should not be used.

Individual Bank Terminal Replacement

3.42 Where it is desired to replace worn bank terminals proceed as in 3.27 to 3.30, inclusive. Then unsolder any wires or strapping connected to the bank terminal and tag them for identification if necessary.

3.43 Loosen the adhesive by which the terminal is held in position by means of the heat from a soldering copper held against the soldering terminal of the bank terminal to be removed. Take care not to touch adjacent terminals with the soldering copper. When the terminal is loose and while it is still hot, grasp the soldering lug of the terminal with the long nose pliers and gently pull the terminal out to the rear of the bank.

3.44 Insert the contacting end of the new bank terminal into the rear (wiring side) of the bank in the space between the varnished muslin left vacant by the removed bank terminal. Take care that the semicircular notch in the edge of the new terminal is toward the bank clamping screw if the terminal is located adjacent to a clamping screw. Press the terminal end of the new bank terminal into the bank taking care not to damage the varnished muslin. Position the new terminal in the bank by eye.

3.45 Reassemble the bank and tighten the bank clamping screws making sure that the terminal remains in its aligned position. Then proceed as outlined in 3.37.

Row of Bank Terminals Replacement

3.46 When several terminals in a row are defective, it may be advisable to replace the entire row as a unit. The row of terminals may be obtained by dismantling a spare unwired bank. Proceed as outlined in

3.26 to 3.28, inclusive. Then unsolder the wires connected to the row of terminals to be replaced and if necessary tag the wires for identification.

3.47 With a 4" regular screwdriver or No. 563A or No. 564A offset screwdriver loosen the bank clamping screws sufficiently to remove the bank frame. Then carefully dismantle the bank as required to remove the defective row of terminals. Care should be taken not to drop the metal separators or the clamping screws.

3.48 Strap terminals of the new row as required. Then reassemble the bank parts inserting the new row of terminals in the proper place. Start all the bank clamping screws a few turns into their respective tapped holes before securely tightening them. Then proceed as outlined in 3.37.

3.49 Attachable Stop: To replace the stop, remove the stop unit assembly as described in 3.16. Remove the old stop. Then move the armature away from the backstop screw and apply the new stop as follows. Insert the long leg of the stop between the armature and screw. At the same time position the end of the long leg behind the armature bearing pin and the U-shaped end of the stop over the front of the armature. Make sure that the stop rests flat along the rear edge of the armature and the end of the backstop screw is entirely within the hole of the stop when the armature is in the unoperated position.